PATENT
Attorney Docket No: SLM-06400

REMARKS

The Applicants respectfully request further examination and reconsideration in view of the amendments above and the arguments set forth fully below. Claims 1-14 and 31-37 were previously pending in this application. Claims 31-37 stand rejected. Claims 1-14 are allowed. Claims 31, 36 and 37 are amended. Claim 35 is canceled. Claims 1-14, 31-34, and 36-37 are pending in this application.

Rejections under 35 U.S.C. §102(e)

Claims 31-35 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,172,796 to Kowarz et al. (hereafter Kowarz). The Applicants respectfully traverse this rejection.

As can be seen in Figures 7-9 and 10-12 of Kowarz, the number of ribbon elements within each ribbon element grouping is related to the number of standoffs 61. In Figures 7-9 of Kowarz, the ribbon elements are grouped into threes which necessitates one standoff 61 per group. In Figures 10-12 of Kowarz, the ribbon elements are grouped into fours which necessitates two different sets of standoffs 61 (Kowarz, col. 8, lines 63-65). Since the standoffs 61 are a fixed feature of each device, the number of ribbon elements within a grouping is also fixed. For example, the number of ribbon elements of the device in Figures 7-9 of Kowarz are grouped into three. This is not variable. As such, *re-configuring a ribbon element group configuration by varying the number of ribbon elements within the group configuration is not possible for a given device.* In order for the number of ribbon elements within a given group configuration to be re-configured, a new device with appropriate standoffs needs to be manufactured.

In contrast, the present invention provides dynamic control of each elongated element so that variable groupings of the elongated elements produce a variable angle blazed diffraction. For example, Figures 14B and 14C illustrate a group configuration comprising six elongated elements. Other group configurations include, but are not limited to, using four elements, five elements, and seven elements (Specification, page 13, line 1 to page 14, line 10). In general, the elongated elements can be dynamically configured into one of a plurality of group configurations, each group configuration comprising n elongated elements.

The amended independent Claim 31 is directed to a light modulator comprising elongated elements arranged parallel to each other and dynamically configurable into one of a plurality of group configurations of the elongated elements, each elongated element comprising a reflective surface such that in operation an incident light illuminating the elongated elements produces a reflected light when the elongated elements are at a first height, each group configuration comprises a specific number of at least three elongated elements within the group configuration, and the light modulator is configured according to a single group configuration at a time, and means for adjusting a relative height of the elongated elements of each of the groupings such that in operation the incident light illuminating the elongated elements produces a single diffraction order selectable between a first diffraction angle and minus the first diffraction angle. As discussed above, Kowarz does not teach dynamically configurable groupings of elements in which each different group configuration includes a different number of elongated elements. For at least these reasons, the independent Claim 31 is allowable over Kowarz.

Claims 32-34 are dependent upon the independent Claim 31. As discussed above, Claim 31 is allowable over the teachings of Kowarz. Accordingly, Claims 32-34 are allowable as being dependent upon an allowable base claim.

Claims 31-33 and 36 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,421,179 to Gutin et al. (hereafter Gutin). The Applicants respectfully traverse this rejection.

Gutin teaches a wavelength division multiplexor or dense wavelength division multiplexor (WDM/DWDM) that utilizes a compound diffraction grating. According to Gutin, the compound diffraction grating 108 can diffract light into a single order or multiple orders. Figure 1 of Gutin illustrates diffraction into a first order (light beams shown as solid lines 110, 112, 114, and 116) and into a second order (light beams shown as dotted lines 124, 126, 128, and 130). However, a single order, e.g. first order, is implied by Gutin to include both the plus and minus order diffracted light, as can be seen in Figure 1. There is no hint, teaching, or suggestion within Gutin to indicate that the single order defines either the plus order diffracted light or the minus order diffracted light, but not both.

In contrast, the present invention diffracts light according to either a first grating period corresponding to a non-activated state or a second grating period corresponding to an activated state for the specific purpose of isolating the diffracted light in the non-activated state verses the

activated state. As a result, while in the activated state, light is diffracted into a single order which is different than the diffracted order into which light is diffracted while in the non-activated state. The single order diffraction is defined as diffraction into one of a plus diffraction order or a minus diffraction order as defined by a diffraction angle and minus the diffraction angle, respectively. This provides significant benefits in the form of higher contrast. As discussed above, Gutin does not teach an incident light diffracted into a single diffraction order, where the single diffraction order comprises plus diffraction order at a diffraction angle or a minus diffraction order at minus the diffraction angle.

Within the Office Action, the dependent Claim 35 is not anticipated by Gutin. Claim 35 includes the limitation that the single diffraction order occurs at a diffraction angle selectable between a first diffraction angle and minus the first diffraction angle. By the above amendments, Claim 35 is canceled and the limitation of Claim 35 is added to the independent Claims 31, 36 and 37.

The amended independent Claim 31 is directed to a light modulator comprising elongated elements arranged parallel to each other and dynamically configurable into one of a plurality of group configurations of the elongated elements, each elongated element comprising a reflective surface such that in operation an incident light illuminating the elongated elements produces a reflected light when the elongated elements are at a first height, each group configuration comprises a specific number of at least three elongated elements within the group configuration, and the light modulator is configured according to a single group configuration at a time, and means for adjusting a relative height of the elongated elements of each of the groupings such that in operation the incident light illuminating the elongated elements produces a single diffraction order selectable between a first diffraction angle and minus the first diffraction angle. As discussed above, Gutin does not teach an incident light diffracted into a single diffraction order, where the single diffraction order comprises plus diffraction order at a diffraction angle or a minus diffraction order at minus the diffraction angle. For at least these reasons, the independent Claim 31 is allowable over Gutin.

Claims 32-33 are dependent upon the independent Claim 31. As discussed above, Claim 31 is allowable over the teachings of Gutin. Accordingly, Claims 32-33 are allowable as being dependent upon an allowable base claim.

The amended independent Claim 36 is directed to a light modulator comprising elongated elements arranged parallel to each other and dynamically configurable into one of a plurality of

group configurations of the elongated elements, each elongated element comprising a reflective surface such that in operation an incident light illuminating the elongated elements produces a reflected light when the elongated elements are at a first height, each group configuration comprises a specific number of at least three elongated elements within the group configuration, and the light modulator is configured according to a single group configuration at a time, and means for adjusting a relative height of the elongated elements of each of the groupings such that in operation the incident light illuminating the elongated elements produces a single diffraction order selectable between a first diffraction angle and minus the first diffraction angle. As discussed above, Gutin does not teach an incident light diffracted into a single diffraction order, where the single diffraction order comprises plus diffraction order at a diffraction angle or a minus diffraction order at minus the diffraction angle. For at least these reasons, the independent Claim 36 is allowable over Gutin.

Claim 37 is rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,268,952 to Godil et al. (hereafter Godil). The Applicants respectfully traverse this rejection.

Godil teaches an optical switch including a phase hologram device with a plurality of ribbons. The ribbons are displaced in varying amounts to emulate a tilting mirror with a normal angle. In Figures 3A-3D of Godil, ribbons are configured in groups of four, the first four ribbons, starting from the left, form group 1 and the second four ribbons form group 2. In Figure 3B, group 1 and group 2 are configured to diffract incident light at diffraction angle $2\theta_1$. By varying the distance of group 2, the incident light is diffracted at diffraction angle $2\theta_2$, as shown in Figure 3C. However, in both cases the number of ribbons in each group remains the same. Godil does not teach varying the group configuration by changing the number of ribbons within a group to form a new group configuration.

As discussed above, the present invention diffracts light according to a single order diffraction where single order diffraction is defined as diffraction into one of a plus diffraction order or a minus diffraction order as defined by a diffraction angle and minus the diffraction angle, respectively. The present invention also provides dynamic control of each elongated element so that variable groupings of the elongated elements produce a variable diffraction angle. In other words, as the number of elongated elements within a grouping is changed, thereby changing the group configuration, the diffraction angle also changes. In this manner, the diffraction angle is varied by changing the group configuration. For example, if the diffraction

angle is θ_3 for a first group configuration with three elongated elements and the diffraction angle is θ_4 for a second group configuration with four elongated elements, then when the first group configuration is changed to the second group configuration, the diffraction angle changes from θ_3 to θ_4.

The independent Claim 37 is directed to a light modulator comprising means for reflecting an incident light, and means for adjusting the means for reflecting such that the incident light diffracts into a single diffraction order selectable between a first diffraction angle and minus the first diffraction angle, wherein the first diffraction angle is variable according to the means for adjusting by reconfiguring a number of elongated elements within an elongated element group configuration. As discussed above, Godil does not teach diffracting light into a single diffraction order having a variable diffraction angle according to re-configuring the number of elements within a group configuration. For at least these reasons, the independent Claim 37 is allowable over Godil.

For the reasons given above, the Applicants respectfully submits that Claims 1-14, 31-34 and 36-37 are now in a condition for allowance, and allowance at an early date would be appreciated. Should the Examiner have any questions or comments, he/she is encouraged to call the undersigned attorney at (408) 530-9700.

Respectfully submitted,
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